Handwritten: 10-10-00 | A

In the United States Patent and Trademark Office
Patent Application Transmittal

Transmitted herewith for filing is the Patent Application of:

Inventors(s):   S. G. Hild and S. K. Singhal

For: Method and Apparatus for Automated Transcoder Selection

Enclosed are

16   pages of specification, including   **27**   claims, plus   **6**   sheets of   *formal*   drawings.

X   An assignment of the invention to International Business Machines Corporation, Armonk, New York 10504.

   A certified copy of a/an   application.

X   Declaration and Power of Attorney.   Signed by inventors.

X   PTO-1449 & references

X   A return post card

   Other:

Filing Fee Calculation (For Other Than Small Entity)

Basic Fee:					$710.00
Claims Fees:	Filed	Limit	Extra	Rate per Extra	
Total claims:	27	20	7	$18.00	$126.00
Independent claims:	7	3	4	$80.00	$320.00
Multiple Dependent Claim Presented				$270.00	$0.00
				Total	$1,156.00

Please charge Deposit Account **09-0461** for the **Total** set forth above. The Commissioner is authorized to charge payment of any additional filing fees required under 37 CFR §1.16 and any patent application processing fees under 37 CFR §1.17 or to credit any overpayment to the identified account. A duplicate copy of this sheet is enclosed.

BY: _____

A. Bruce Clay

Attorney of Record Reg. No.   32,121

Date: October 6, 2000

IBM Corporation T81/503
Intellectual Property Law
PO Box 12195
Res. Tri. Park, NC 27709

Telephone: 919-254-6717   FAX 919-254-4330

Express Mail Certificate

Express Mail Label No: EK873466807US

Date: October 6, 2000

I hereby certify that I am depositing the papers identified above with the U.S. Postal Service "Express Mail Post Office to Address" service on the above date, addressed to the Commissioner of Patents and Trademarks, Washington, DC 20231

Catherine M. Robbins

transmit.wpt 09292000

INVENTORS: S. G. Hild and S. K. Singhal

METHOD AND APPARATUS FOR AUTOMATED TRANSCODER SELECTION

1. Field of the Invention:

The present invention relates generally to an improved data processing system, and in particular to a method and apparatus for transferring data between different data processing systems. Still more particularly, the present invention provides a method and apparatus for selecting a transcoder for use in translating content.

2. Background of the Invention:

Today, computing functions traditionally found only in desktop or laptop personal computers are being integrated into many different types of devices. For example, personal digital assistants (PDAs), such as the Palm Pilot (available

Docket No. RSW9-2000-0075-US1

from Palm Computing, Inc.), now often provide for web browsing functions and can be connected to the Internet using wireless modems. These same PDAs can be used to access and download e-mail, as well as execute various custom

5   applications. Browsing capabilities and e-mail access are also found in digital wireless phones such as those communicating using the Wireless Application Protocol (WAP). Computing power also is being introduced into home appliances, such as refrigerators. Other examples of

10   pervasive computing devices include automotive computers that provide browsing, messaging, and emergency communications capabilities; screen phones that mix Web access with voice communications; and Web-enabled televisions that support interactive television programming and Web access.

15   Pervasive computing aims at enabling a diverse range of devices to access an equally diverse range of data servers. Presently, different types of devices require different types of data format because no one universally accepted content format is present. Instead, a variety of content formats,

20   such as, for example, Hypertext Markup Language (HTML), Wireless Markup Language (WML), Compact HTML (cHTML), VoxML, and VoiceXML are used in different markets or device classes. Presently, content providers are forced to maintain and operate a number of separate servers or server infrastructure

25   elements in which each of these servers or elements provides content and applications for different supported content

formats. Such a requirement is costly and burdensome for content providers.

One potential solution to this problem involves the use of transcoders. A transcoder is an infrastructure element that sits between a content source and a device. This element is capable of "translating" content from one format into another, such as the content format delivered by the server into the content format expected by the device. This solution, however, requires significant investment in creating transcoders, installing them, and configuring an appropriate rule base that determines which transcoders to apply to a particular client request and server content. In most existing transcoding systems, generic transcoders are used to convert various server-generated content types into the client-supported content types. These generic transcoders are cheapest to develop, may be used across a large range of content sources, and can support all devices of a particular type. However, because these transcoders are only associated with the source and target content types, they cannot take advantage of any special formatting or features present in the particular source content. Moreover, these transcoders cannot take advantage of any special capabilities present in the client device, nor can they address preferences of the particular user. The alternative approach is to develop specific transcoders for different types of applications or devices or for different individual users. A particular transcoder of this type is limited in

the types of content sources, users, or devices that it can handle. A resulting system must therefore include many such transcoders, which increases the overall implementation cost, maintenance cost, and system complexity.

5   Therefore, it would be advantageous to have an improved method and apparatus for translating content generated by a particular server or application from its source format into a format for use by a target device and a user.

SUMMARY OF THE INVENTION

The present invention provides a method in a data processing system for transcoding content using a set of transcoders. A request is received for the content from a client, wherein the request includes a set of characteristics. A transcoder is selected from the set of transcoders having a best match to the set of characteristics. The content is transcoded using the transcoder to form transcoded content.

Docket No. RSW9-2000-0075-US1

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 depicts a pictorial representation of a distributed data processing system in which the present invention may be implemented;

Figure 2 is a block diagram of a data processing system that may be implemented as a server in accordance with a preferred embodiment of the present invention;

Figure 3 is a block diagram of a client in accordance with a preferred embodiment of the present invention;

Figure 4 is a block diagram illustrating selection of a transcoder for a request in accordance with a preferred embodiment of the present invention;

Figure 5 is a diagram of a table of transcoder and tuple associations in accordance with a preferred embodiment of the present invention; and

Figure 6 is a flowchart of a process used for automated transcoder selection in accordance with a preferred embodiment of the present invention.

Docket No. RSW9-2000-0075-US1

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures, **Figure 1** depicts a
pictorial representation of a distributed data processing
system in which the present invention may be implemented.
Distributed data processing system **100** is a network of
computers in which the present invention may be implemented.
Distributed data processing system **100** contains a network **102**,
which is the medium used to provide communications links
between various devices and computers connected together within
distributed data processing system **100**. Network **102** may include
permanent connections, such as wire or fiber optic cables, or
temporary connections made through telephone connections.

In the depicted example, a server **104** is connected to
network **102** along with storage unit **106**. In addition, clients
108, **110**, and **112** also are connected to network **102**. These
clients **108**, **110**, and **112** may be, for example, personal
computers or network computers. For purposes of this
application, a network computer is any computer, coupled to a
network, which receives a program or other application from
another computer coupled to the network. Clients **114** and **116**
in these examples are pervasive devices, which communicate
using wireless communication links. Clients **114** and **116** may
be, for example, PDAs or some other hand-held computing device.
Although these clients communicate with network **102** using

Docket No. RSW9-2000-0075-US1

wireless links, a physical connection, such as a phone line or Ethernet connection may be used.

In the depicted example, server **104** provides data, such as boot files, operating system images, and applications to clients **108-116**. Clients **108-116** are clients to server **104**. Distributed data processing system **100** may include additional servers, clients, and other devices not shown. In the depicted example, distributed data processing system **100** is the Internet with network **102** representing a worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. At the heart of the Internet is a backbone of high-speed data communication lines between major nodes or host computers, consisting of thousands of commercial, government, educational and other computer systems that route data and messages. Of course, distributed data processing system **100** also may be implemented as a number of different types of networks, such as for example, an intranet, a local area network (LAN), and or a wide area network (WAN). These networks also include mechanisms for wireless communications links in these examples. **Figure 1** is intended as an example, and not as an architectural limitation for the present invention.

Referring to **Figure 2**, a block diagram of a data processing system that may be implemented as a server, such as server **104** in **Figure 1**, is depicted in accordance with a preferred embodiment of the present invention. The processes of the present invention are implemented in a server, such as

data processing system **200** in these examples. Data processing

system **200** may be a symmetric multiprocessor (SMP) system

including a plurality of processors **202** and **204** connected to

system bus **206**. Alternatively, a single processor system may

5 be employed. Also connected to system bus **206** is memory

controller/cache **208**, which provides an interface to local

memory **209**. I/O bus bridge **210** is connected to system bus **206**

and provides an interface to I/O bus **212**. Memory

controller/cache **208** and I/O bus bridge **210** may be integrated

10 as depicted.

Peripheral component interconnect (PCI) bus bridge **214**

connected to I/O bus **212** provides an interface to PCI local bus

216. A number of modems may be connected to PCI bus **216**.

Typical PCI bus implementations will support four PCI expansion

15 slots or add-in connectors. Communications links to network

computers **108-112** in **Figure 1** may be provided through modem **218**

and network adapter **220** connected to PCI local bus **216** through

add-in boards.

Additional PCI bus bridges **222** and **224** provide interfaces

20 for additional PCI buses **226** and **228**, from which additional

modems or network adapters may be supported. In this manner,

data processing system **200** allows connections to multiple

network computers. A memory-mapped graphics adapter **230** and

hard disk **232** may also be connected to I/O bus **212** as depicted,

25 either directly or indirectly.

Those of ordinary skill in the art will appreciate that

the hardware depicted in **Figure 2** may vary. For example, other

peripheral devices, such as optical disk drives and the like, also may be used in addition to or in place of the hardware depicted. The depicted example is not meant to imply architectural limitations with respect to the present invention.

The data processing system depicted in **Figure 2** may be, for example, an IBM RISC/System 6000 system, a product of International Business Machines Corporation in Armonk, New York, running the Advanced Interactive Executive (AIX) operating system.

Turning next to **Figure 3**, a block diagram of a client is depicted in accordance with a preferred embodiment of the present invention. In this example, data processing system **300** is an example of a client, such as client **108** or client **116** in **Figure 1**. Data processing system **300** includes a bus **302**, which interconnects and provides communication between processing unit **304**, storage device **306**, input/output (I/O) unit **308**, and communications unit **310**. Processing unit **304** may include one or more processors and executes instructions located in storage device **306**. Storage device **306** contains instructions for performing various functions as well as data and may take various forms depending on the type of client. For example, storage device **306** may be a random access memory (RAM), a read-only memory (ROM), a non-volatile RAM (NVRAM), or a hard disk drive. I/O unit **308** provides interactive with data processing system **300** and typically includes a display device as well as an input device, such as a keyboard, touchpad, mouse, or touch

screen.   Communications unit **310** provides for exchanging data with other systems.   Communications unit **310** may take various forms, such as, for example, a wireless modem or a network adapter.   Data processing system **300** may take many forms, such as, for example, a PDA, kiosk, laptop computer, or a palm top computer.

The present invention provides a method, apparatus, and computer implemented instructions for translating content from a source format to a target format.   The mechanism of the present invention allows for the use of both specific and generic transcoders based on a particular request from a client.   The mechanism of the present invention allows for generic transcoder plug-ins with specific transcoder plug-ins (which are appropriate for a particular application, client device, and/or user) in a manner allowing a particular request to be handled by the most specific transcoding engine available.   In this manner, specific transcoders may be used when available, but generic transcoders are used when specific ones are not available.

Turning next to **Figure 4**, a block diagram illustrating selection of a transcoder for a request is depicted in accordance with a preferred embodiment of the present invention.   In this example, client **400** sends a request to server **402** for content located in content database **404**.   Though not shown in **Figure 4**, content database **404** may be located on a separate server and accessed by means of a direct database request or by means of a Web server request delivered over

HTTP, WSP, or some other protocol. Also, the content delivered from this content database **404** may be generated dynamically, for example, by means of server-side applications such as Java servlets, Common-Gateway Interface (CGI) programs, Active Server Pages (ASPs), or JavaServer Pages. This request is processed by server request process **406**. When the request is received, a transcoder is selected from transcoders **408** to translate content from content database **404** into a format for use by client **400**. This selection of transcoders is performed using a transcoder table **410** to identify the appropriate transcoder from transcoders **408** to translate content from content database **404** into a desired or target content.

In these examples, the request received from client **400** is represented as a tuple of parameters containing a document type definition (DTD), an application, a device, and a user. The DTD defines the type of document, such as HTML or WML, requested by the client. The application identifies the type of application that is to receive the content, such as a mail program or a web browser. The device is used to identify the type of device that the content is to be processed or displayed on, such as, for example, a PDA or a desktop computer. The user name may be used to identify a specific user. A transcoder for a specific user may account for the user's particular color preferences, for example, screen layout preferences, or sound choices. Of course, other information may be included in the request to select a transcoder. For example, a network identification also may be included. Each

transcoder in transcoders **408** is associated with a tuple with these associations being stored in transcoder table **410** in these examples.

The tuple associated with a transcoder may include a wild card or an absence of a particular parameter to indicate that that parameter is not specified for a particular transcoder. Server request process **406** performs a hierarchical search to find the most specific translator present for the request. In these examples, the search is initiated from most specificity to least specificity as follows:(DTD, application, device, user), (DTD, application, device, *), (DTD, application, *, *), (DTD, *, *, *), and (*, *, device, *) with "*" indicating a wild card. Alternative embodiments of the present invention may define different search templates and different orderings of these search templates to identify the most specific transcoder to apply to the particular request. In this manner, server request process **406** attempts to locate a transcoder exactly matching a particular application for a particular user and device. If such a transcoder is absent, server request process **406** then looks for an application specific transcoder for the device. If such a transcoder is absent, then a generic transcoder for the device is selected for use in translating the content.

Referring now to **Figure 5**, a diagram of a table of transcoder and tuple associations are depicted in accordance with a preferred embodiment of the present invention. In this example, table **500** is an example of a table, such as transcoder

Docket No. RSW9-2000-0075-US1

table **410** in **Figure 4**. Table **500** includes tuples in column **502** and transcoders in column **504**. Depending on the specificity of the request, a specific transcoder, such as transcoder 1 in column **504** may be selected or a more generic transcoder, such as transcoder 6 may be selected for use in translating content for the client.

Turning next to **Figure 6**, a flowchart of a process used for automated transcoder selection is depicted in accordance with a preferred embodiment of the present invention. The process illustrated in **Figure 6** may be implemented in a server request process, such as server request process **406** in **Figure 4** to automatically select a transcoder in response to receiving a request for content.

The process begins by receiving a request from a client (step **600**). In these examples, the request includes a DTD, an application, a device, and a user in addition to an identification of the content desired by the client. These parameters are identified (step **602**). A search for the particular DTD, device, and user is made (step **604**). This search is made in a transcoder table, such as transcoder table **410** in **Figure 4**. A determination is made as to whether a match is found (step **606**). If a match is absent, a search for a more generic transcoder is performed based on DTD, application, and device from the request (step **608**). A determination is made as to whether a transcoder matching these parameters is present (step **610**). If a transcoder is absent for these parameters, a search using the DTD and the application is made (step **612**). A

determination is made as to whether a transcoder matching the particular DTD and application is present (step **614**). If a match is absent, then a search using just the device type is made (step **616**). A determination is made as to whether a transcoder matching the particular device is present (step **618**). If no transcoder is found, then the unmodified content (or, in an alternative embodiment, an error) is returned to the user (step **620**) with the process terminating thereafter. With reference again to steps **606**, **610**, **614**, and **618**, if a match is found in any of these searches, the identified transcoder is used to translate the content (step **622**) with the process then proceeding to step **620** as described above.

Thus, the present invention provides an improved method and apparatus for automatically selecting a transcoder for translating content for a client. The mechanism of the present invention attempts to locate a transcoder using a hierarchical search to look for the most specific transcoder available for the request. The selection of the transcoder is based on the request and in particular based on the parameters included in the request. The mechanism of the present invention allows for a mixing of generic transcoders with more specific ones. In this manner, specific transcoders may be developed as needed or warranted while generic transcoders are available in the absence of a more specific one.

It is important to note that while the present invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will

appreciate that the processes of the present invention are capable of being distributed in the form of a computer readable medium of instructions and a variety of forms and that the present invention applies equally regardless of the particular type of signal bearing media actually used to carry out the distribution. Examples of computer readable media include recordable-type media such a floppy disc, a hard disk drive, a RAM, CD-ROMs, and transmission-type media such as digital and analog communications links.

The description of the present invention has been presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.

Docket No. RSW9-2000-0075-US1

CLAIMS:

What is claimed is:

1   1. A method in a data processing system for transcoding

2   content using a set of transcoders, the method comprising:

3   receiving a request for the content from a client,

4   wherein the request includes a set of characteristics;

5   selecting a transcoder from the set of transcoders

6   having a best match to the set of characteristics; and

7   transcoding the content using the transcoder to form

8   transcoded content.

2. The method of claim 1 further comprising:

          sending the transcoded content to the client.

3. The method of claim 1, wherein the set of

characteristics includes a content type and a set of client

characteristics.

1   4. The method of claim 1, wherein the set of

2   characteristics is a tuple including parameters for a

3   document type definition, an application, a device, and a

4   user.

1   5. The method of claim 1, wherein the client is one of a

2   personal digital assistant, a laptop computer, and a personal

3   computer.

Docket No. RSW9-2000-0075-US1

6. A method in a data processing system for transcoding content using a set of transcoders, the method comprising:

receiving a request for the content, wherein the request includes identification information for a client originating the request;

selecting a transcoder from the set of transcoders, wherein the transcoder provides a closest match to the identification information; and

processing the content using the transcoder.

7. The method of claim 6, wherein the identification information comprises a content type and a set of client characteristics.

8. The method of claim 6, wherein the identification information comprises a document type definition, an application, a device, and a user.

9. The method of claim 6 further comprising:
sending the transcoded content to the client.

10. The method of claim 6, wherein the client is one of a personal digital assistant, a laptop computer, and a personal computer.

11. A data processing system comprising:
a bus system;
a communications unit connected to the bus system;

Docket No. RSW9-2000-0075-US1

4   a memory connected to the bus system, wherein the memory

5   includes as set of instructions; and

6   a processing unit connected to the bus system, wherein

7   the processing unit executes the set of instructions to

8   receive a request for the content from a client through the

9   communications unit in which the request includes a set of

10 characteristics, select a transcoder from the set of

11 transcoders have a best match to the set of characteristics,

12 and transcode the content using the transcoder to form

13 transcoded content.

12. The data processing system of claim 11, wherein the bus
system is a single bus.

13. The data processing system of claim 11, wherein the bus
system includes a primary bus and a secondary bus.

14. The data processing system of claim 11, wherein the
processing unit includes a plurality of processors.

15. The data processing system of claim 11, wherein the
communications unit is one of a modem and Ethernet adapter.

1   16. A data processing system for transcoding content using a

2   set of transcoders, the data processing system comprising:

3   receiving means for receiving a request for the content

4   from a client, wherein the request includes a set of

5   characteristics;

Docket No. RSW9-2000-0075-US1

6   selecting means for selecting a transcoder from the set

7   of transcoders having a best match to the set of

8   characteristics; and

9   transcoding means for transcoding the content using the

10 transcoder to form transcoded content.

1   17.   The data processing system of claim 16 further

2   comprising:

3   sending means for sending the transcoded content to the

4   client.

1   18.   The data processing system of claim 16, wherein the set

2   of characteristics includes a content type and a set of

3   client characteristics.

1   19.   The data processing system of claim 16, wherein the set

2   of characteristics is a tuple including parameters for a

3   document type definition, an application, a device, and a

4   user.

1   20.   The data processing system of claim 16, wherein the

2   client is one of a personal digital assistant, a laptop

3   computer, and a personal computer.

1   21.   A data processing system for transcoding content using a

2   set of transcoders, the data processing system

3   comprising:

4   receiving means for receiving a request for the content,

5   wherein the request includes identification information for a

6   client originating the request;

7   selecting means for selecting a transcoder from the set

8   of transcoders, wherein the transcoder provides a closest

9   match to the identification information; and

10   processing means for processing the content using the

11   transcoder.

1   22. The data processing system of claim 21, wherein the

2   identification information comprises a content type and a set

3   of client characteristics.

1   23. The data processing system of claim 21, wherein the

2   identification information comprises a document type

3   definition, an application, a device, and a user.

1   24. The data processing system of claim 21 further

2   comprising:

3   sending means for sending the transcoded content to the

4   client.

1   25. The data processing system of claim 21, wherein the

2   client is one of a personal digital assistant, a laptop

3   computer, and a personal computer.

1   26. A computer program product in a computer readable medium

2   for use in a data processing system for transcoding content

3   using a set of transcoders, the computer program product comprising:

4   first instructions for receiving a request for the

5   content from a client, wherein the request includes a set of

6   characteristics;

7   second instructions for selecting a transcoder from the

8   set of transcoders having a best match to the set of

9   characteristics; and

10   third instructions for transcoding the content using the

11   transcoder to form transcoded content.

1   27. A computer program product in a computer readable medium

2   for use in a data processing system for transcoding content

3   using a set of transcoders, the computer program product

4   comprising:

5   first instructions for receiving a request for the

6   content, wherein the request includes identification

7   information for a client originating the request;

8   second instructions for selecting a transcoder from the

9   set of transcoders, wherein the transcoder provides a closest

10   match to the identification information; and

11   third instructions for processing the content using the

12   transcoder.

ABSTRACT OF THE DISCLOSURE

METHOD AND APPARATUS FOR AUTOMATED TRANSCODER SELECTION

A method and apparatus for automated transcoder selection in a data processing system for transcoding content using a set of transcoders. A request is received for the content from a client, wherein the request includes a set of characteristics. A transcoder is selected from the set of transcoders having a best match to the set of characteristics. The content is transcoded using the transcoder to form transcoded content.

Docket No. RSW9-2000-0075-US1

Figure 1

RSW9-2000-0075-US1

116

114

108

PDA

PDA

Client

110

104

102
Network

Client

Server

Storage

Client

100

106

112

Processor
202

Processor
204

206

System Bus

208

Memory
Controller/
Cache

I/O Bridge

210

212

216

PCI Bus
Bridge
214

PCI Bus

Local Memory
209

218

220

Modem

Network
Adapter

200

Graphics
Adapter
230

226

PCI Bus
Bridge
222

PCI Bus

I/O Bus

228

Hard Disk
232

PCI Bus
Bridge
224

PCI Bus
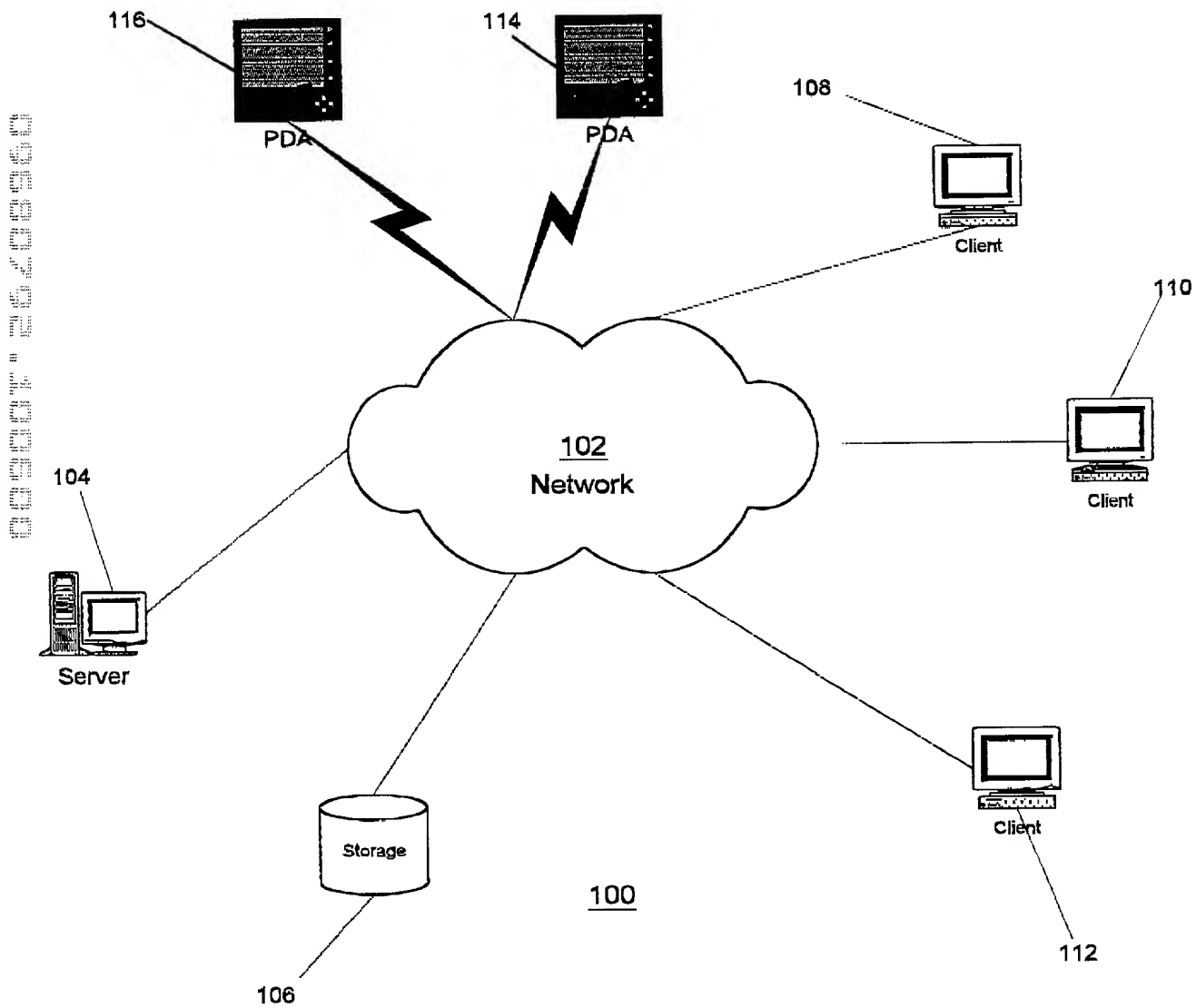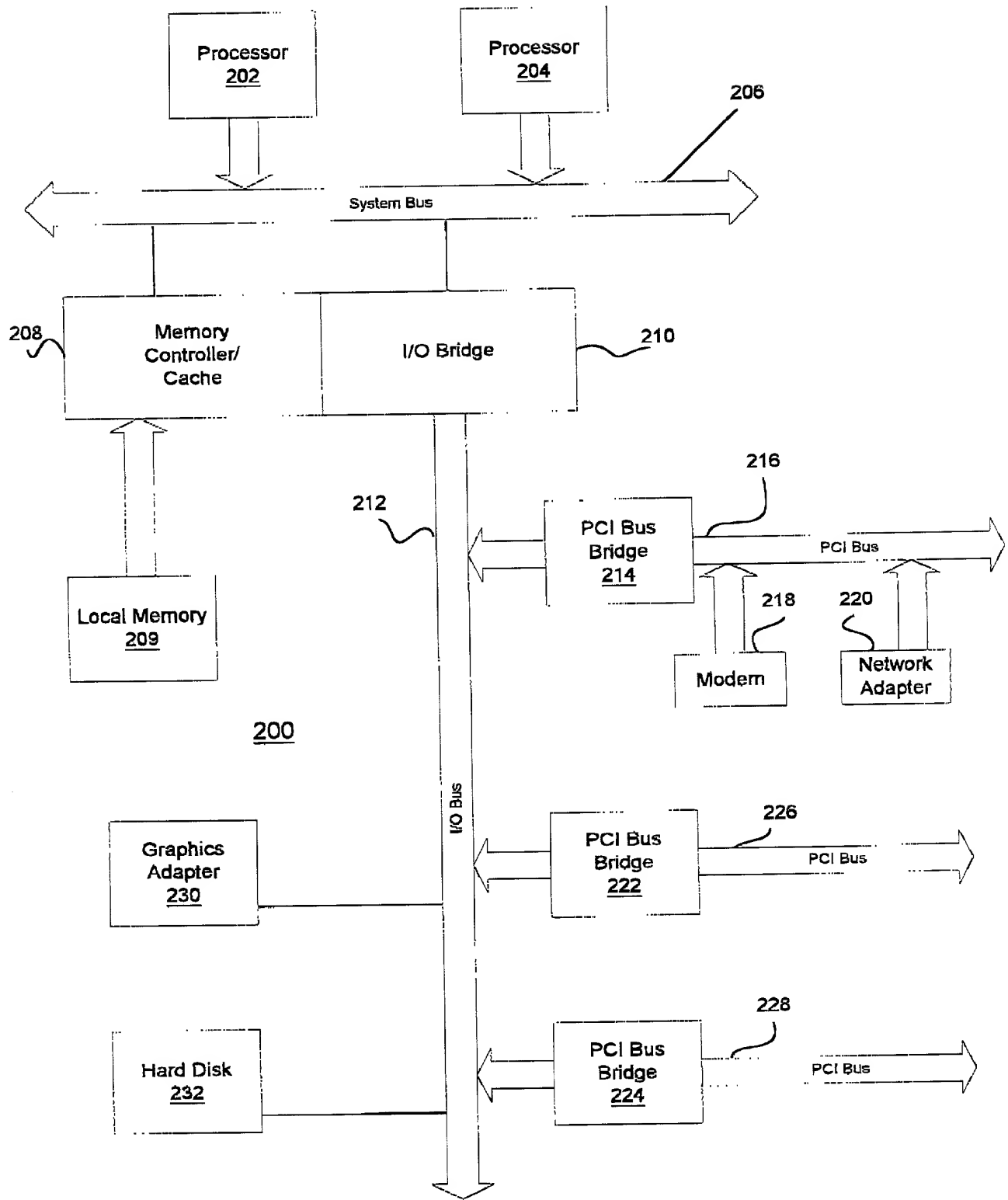
Figure 2

RSW9-2000-0075-US1

Figure 3

RSW9-2000-0075-US1

```
          ┌─────────────────┐        ┌─────────────────┐
          │ Processing Unit │        │ Storage Device  │
          │       304       │        │       306       │
          └─────────────────┘        └─────────────────┘
                  ↕                          ↕

    ◄═══════════════════════════════════════════════════════►
                              302

                  ↕                          ↕
          ┌─────────────────┐        ┌─────────────────┐
          │       I/O       │        │ Communications  │        300
          │       308       │        │       310       │
          └─────────────────┘        └─────────────────┘
```
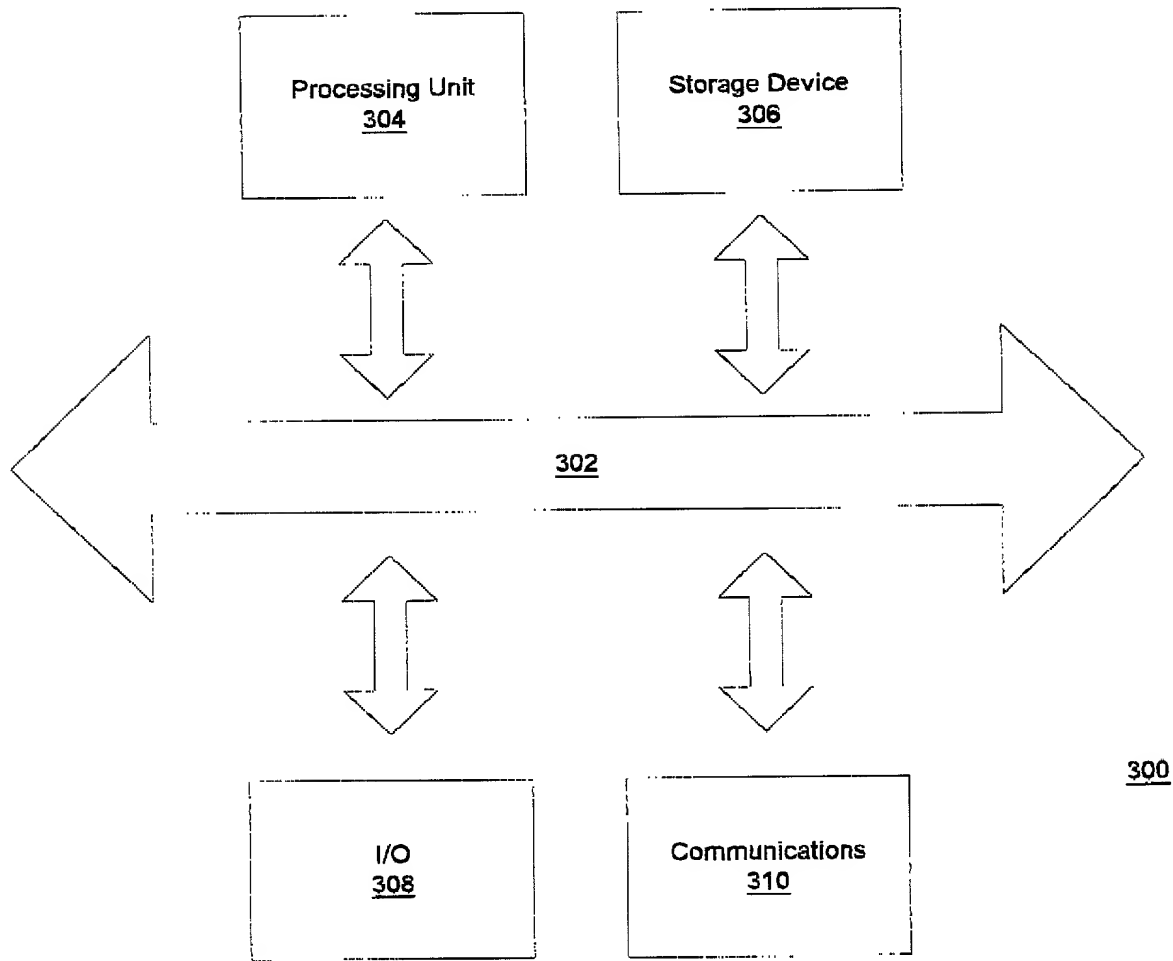
Figure 4

RSW9-2000-0075-US1
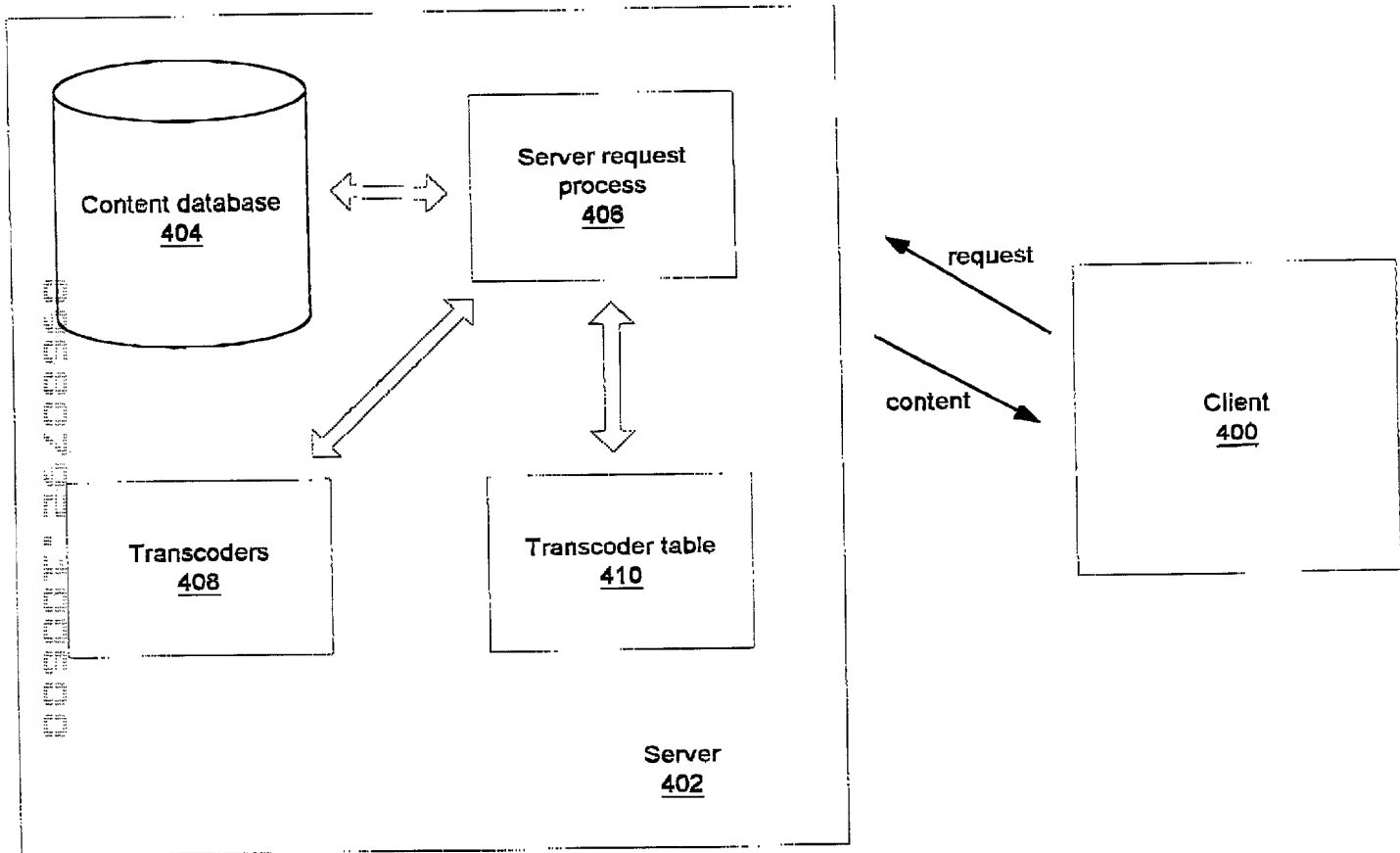
Figure 5

RSW9-2000-0075-US1

500

DTD	application 1	device 1	user 1	transcoder 1
DTD	application 1	device 1	user 2	transcoder 2
DTD	application 1	device 1	*	transcoder 3
DTD	application 2	*	*	transcoder 4
DTD	application 2	device 1	*	transcoder 5
DTD	*	*	*	transcoder 6
*	*	device 2		transcoder 7

502

504

Figure 6

RSW9-2000-0075-US1

676

```
                    ( Begin )
                        │
                        ▼
            ┌───────────────────────────┐
            │      Receive request       │
            │            600             │
            └───────────────────────────┘
                        │
                        ▼
            ┌───────────────────────────────────────┐
            │ Identify DTD application, markup,      │
            │ device, and user                       │
            │                602                     │
            └───────────────────────────────────────┘
                        │
                        ▼
            ┌───────────────────────────────────────┐
            │    Search for DTD, device, and user    │
            │                604                     │
            └───────────────────────────────────────┘
                        │
                        ▼
                  ◇ Match?  ◇ ──────────── Yes ──────┐
                    606                               │
                        │ No                          │
                        ▼                             │
            ┌───────────────────────────────────────┐│
            │  Search for DTD, application, device   ││
            │                608                     ││
            └───────────────────────────────────────┘│
                        │                             │
                        ▼                             │
                  ◇ Match?  ◇ ──────────── Yes ───────│──┐
                    610                               │  │
                        │ No                          │  │
                        ▼                             │  │
            ┌───────────────────────────────────────┐│  │
            │      Search for DTD and application    ││  │
            │                612                     ││  │
            └───────────────────────────────────────┘│  │
                        │                             │  │
                        ▼                             │  │
                  ◇ Match?  ◇ ─── Yes ──┐             │  │
                    614                 │             │  │
                        │ No            ▼             ▼  │
                        ▼      ┌──────────────────────┐ │
            ┌───────────────┐  │ Use identified       │◄┘
            │ Search using  │  │ transcoder           │
            │ device type   │  │        622           │
            │     616       │  └──────────────────────┘
            └───────────────┘          │
                        │ Yes          │
                        ▼              │
                  ◇ Match?  ◇ ─────────┘
                    618
                        │ No
                        ▼
            ┌───────────────────────────────────────┐
            │   Return unmodified content to user    │◄─────
            │                620                     │
            └───────────────────────────────────────┘
                        │
                        ▼
                    (  End  )
```
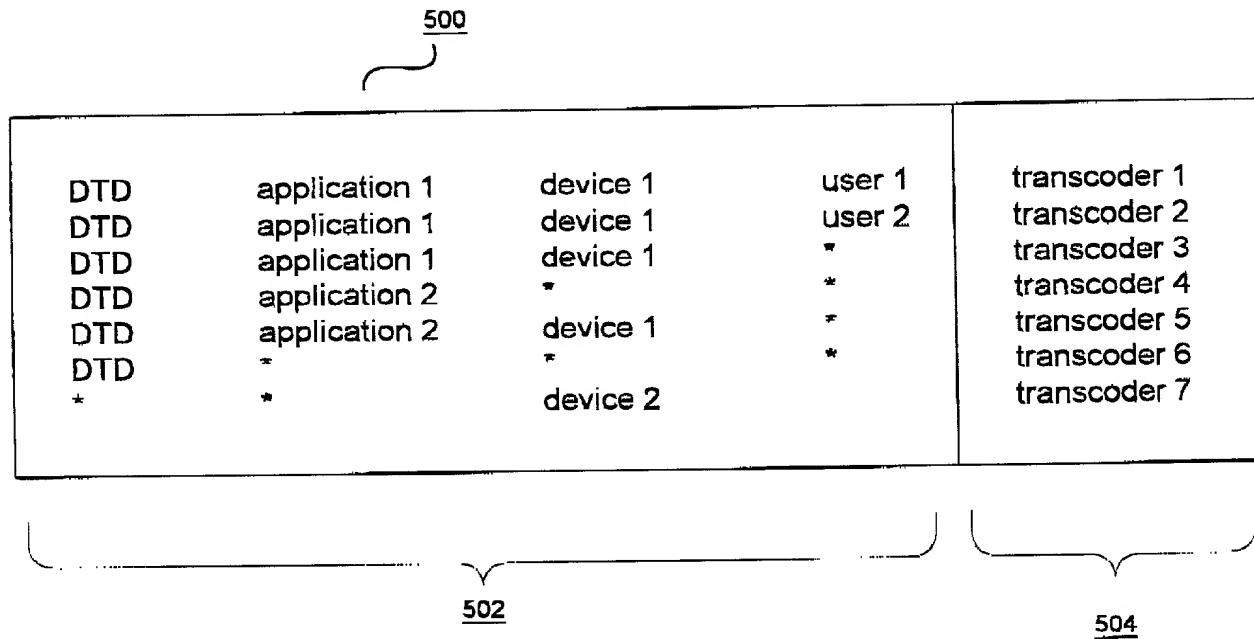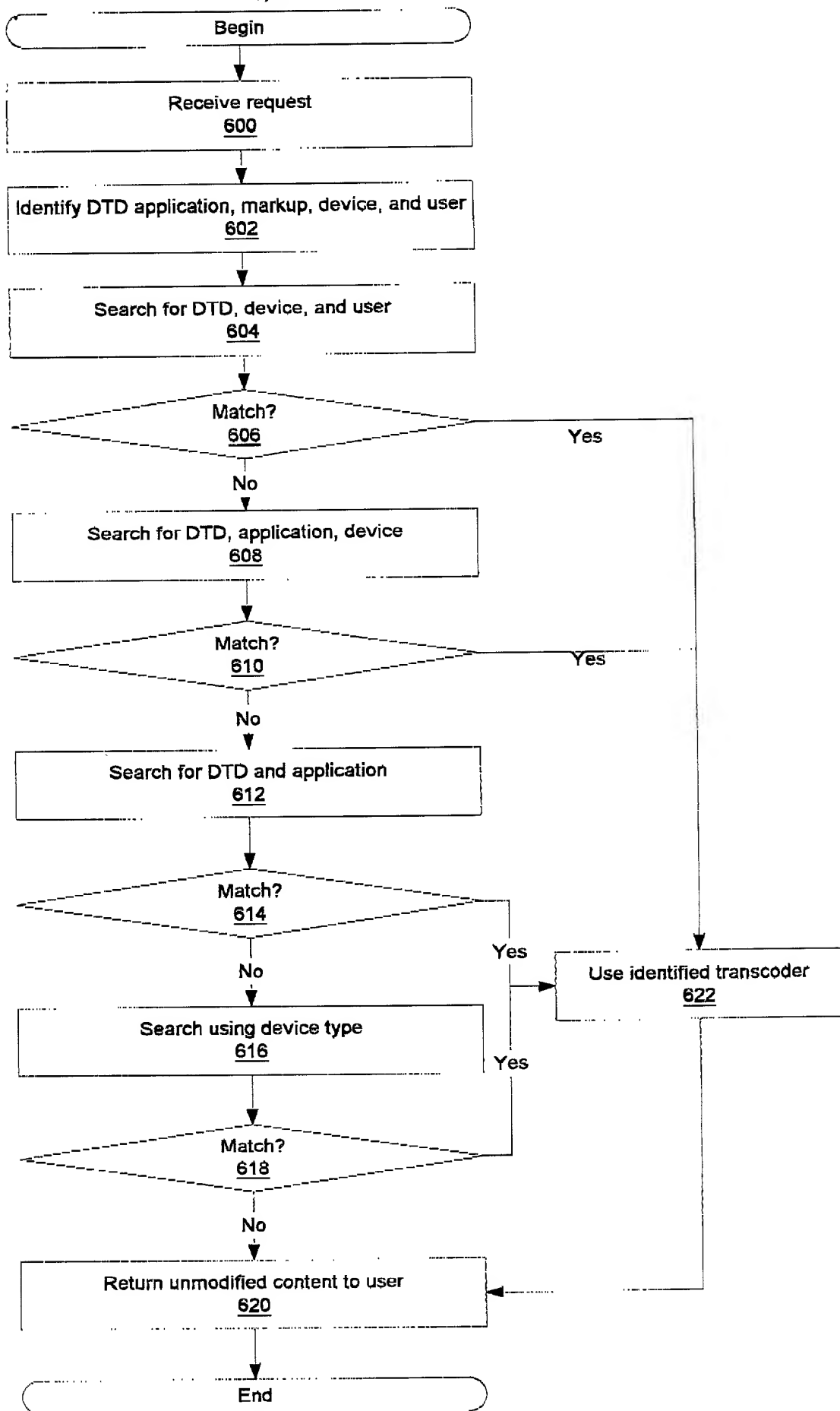
DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method and Apparatus for Automated Transcoder Selection

the specification of which is identified by the attorney (IBM) Docket Number appearing above.

I hereby state that I have reviewed and understand the contents of the above- identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Number	Country	Day/Month/Year	Priority Claimed

I hereby claim the benefit (a) under Title 35, United States Code, §119(e) of any U.S. application listed below and identified as a provisional application or (b) under Title 35, United States Code, §120 of any U.S. application listed below and not identified as a provisional application, and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior U.S. application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information material to the patentability of this application as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application

Prior U.S. Applications

Serial No.	Filing Date	Status

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

As a named inventor, I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:
A. Bruce Clay, Reg. No. 32,121; Gregory M. Doudnikoff, Reg. No. 32,847; Edward H. Duffield, Reg. No. 25,970; Jerry W. Herndon, Reg. No. 27,901; Gerald R. Woods, Reg. No. 24,144; Jeanine S. Ray-Yarletts, Reg. No. 39,808; Joseph C. Redmond, Jr., Reg. No. 18,753; John E. Hoel, Reg. No. 26,279; Christopher A. Hughes, Reg. No. 26,914; and Edward A. Pennington, Reg. No. 32,588;

AND also,

Send all correspondence to: A. Bruce Clay, IBM Corporation T81/503; PO Box 12195; Research Triangle Park, NC 27709.

First Inventor: **Stefan Georg Hild**

Signature: _____

                                                                             Date

Residence: Zurich, Switzerland

Citizenship: German

Post Office Address: Austrasse 27, 8134 Adliswil
Zurich, Switzerland

Second Inventor: **Sandeep K. Singhal**

Signature: *Sandeep K. Singhal*　　　　　　　　　　　　　　*28 September 2000*

                                                                                Date

Residence: 2 Leighton Street
Englewood Cliffs, New Jersey 07632-1414

Citizenship: USA

Post Office Address: Same

DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method and Apparatus for Automated Transcoder Selection

the specification of which is identified by the attorney (IBM) Docket Number appearing above.

I hereby state that I have reviewed and understand the contents of the above- identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Number	Country	Day/Month/Year	Priority Claimed

I hereby claim the benefit (a) under Title 35, United States Code, §119(e) of any U.S. application listed below and identified as a provisional application or (b) under Title 35, United States Code, §120 of any U.S. application listed below and not identified as a provisional application, and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior U.S. application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information material to the patentability of this application as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application

Prior U.S. Applications

Serial No.	Filing Date	Status

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

As a named inventor, I hereby appoint the following attorneys and/or agents to prosecute this application and

1

transact all business in the Patent and Trademark Office connected therewith:
A. Bruce Clay, Reg. No. 32,121; Gregory M. Doudnikoff, Reg. No. 32,847; Edward H. Duffield, Reg. No. 25,970; Jerry W. Herndon, Reg. No. 27,901; Gerald R. Woods, Reg. No. 24,144; Jeanine S. Ray-Yarletts, Reg. No. 39,808; Joseph C. Redmond, Jr., Reg. No. 18,753; John E. Hoel, Reg. No. 26,279; Christopher A. Hughes, Reg. No. 26,914; and Edward A. Pennington, Reg. No. 32,588;
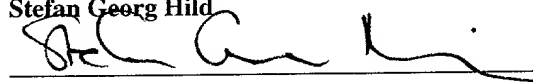
AND also,

Send all correspondence to: A. Bruce Clay, IBM Corporation T81/062; PO Box 12195; Research Triangle Park, NC 27709.
503

First Inventor:	Stefan Georg Hild
Signature:	9-23-2000
	Date

Residence:	Zurich, Switzerland
Citizenship:	German
Post Office Address:	Austrasse 27, 8134 Adliswil Zurich, Switzerland

Second Inventor:	Sandeep K. Singhal
Signature:	
	Date
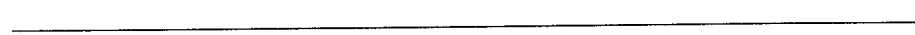
Residence:	
Citizenship:	USA
Post Office Address:	

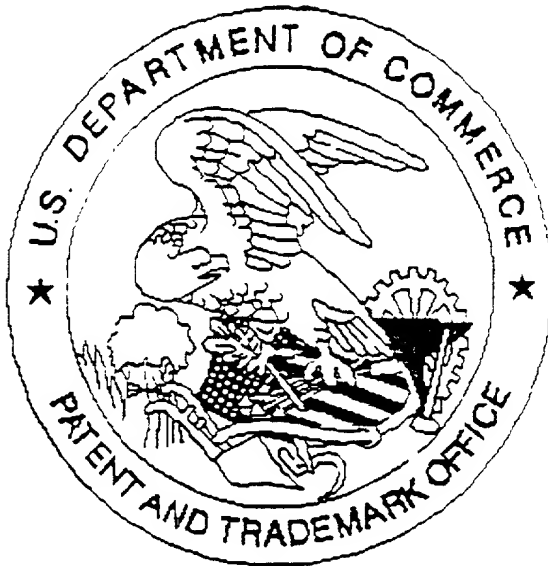| **Third Inventor:**	
Signature:	
	Date

Residence:	
Citizenship:	
Post Office Address:	

United States Patent & Trademark Office
Office of Initial Patent Examination -- Scanning Division

Application deficiencies were found during scanning:

☐ Page(s)___3___ of ___Declaration___ were not present
for scanning.
(Document title)

☐ Page(s)_____ of _____ were not present
for scanning.
(Document title)

☐ Scanned copy is best available.